National Geodetic Survey Positioning America for the Future

Ecosystem & Climate Operations

# Geodesy at the Water's Edge: The newsletter of the NGS ECO Team

**November/December 2014**

**In this issue:**



## 1. Welcome, and a look ahead to 2015

In an effort to build a broader community of those who care about coastal elevations and water levels, we are sharing this end-of-year newsletter with an expanded list of past and present NGS ECO stakeholders. If this is your first issue of our newsletter and you would like to remain informed of our activities and share information relative to the application of geodesy in coastal zones and habitats, please sign up to join our newsletter! You will receive a rather brief newsletter like this once every two months. Welcome aboard!

We'd also like to welcome back Christine Gallagher! In Nov. 2014, Christine returned to NGS from a three-month assignment at the NOAA Budget Office. Prior to this assignment, Christine was leading NGS ECO as well as coordinating the Height Modernization Program; now that she has returned to NGS, she is the Constituent Resource Manager, a new position aimed at supporting all NGS stakeholders, including those who work with ECO and Height Mod. We are thrilled that Christine will continue to find ways of supporting NGS ECO in addition to her expanding roles and responsibilities. Welcome back Christine!

Finally, 2015 is promising to be another exciting year for NGS ECO as we will:

- finally publish our guidelines for geospatial infrastructure in support of sea level change sentinel sites;
- continue to work closely with the Chesapeake Bay Sentinel Site Cooperative to help implement one or more pilot "human built" sentinel sites;
- continue working with our partners in the National Park Service on Surface Elevation Table (SET) Protocols and on research in the development of high accuracy geospatial infrastructure at the Assateague Island National Seashore;
- continue to work with our friends at the Smithsonian to build out their geospatial infrastructure at their Tennenbaum Marine Observatories Network and the Smithsonian Environmental Research Center;
- continue supporting our partners within the National Estuarine Research Reserve System (NERRS), and hope to publish our studies on SET errors, "time to stability" in SET trend analysis, and new techniques for measuring wetland elevation change.
- publish a short video explaining how geospatial infrastructure is used in coastal areas to support informed decision making in the face of changing water levels and inundation.

## 2. NGS and CO-OPS explore ways to publish leveling at tide stations

Tide stations collect water level data, which are used to generate many useful products including long-term sea level trends. To ensure a water level station remains stable over time, the Center for Operational Oceanographic Products & Services (CO-OPS, http://tidesandcurrents.noaa.gov/ ) installs 5 to 10 tidal bench marks per station and annually completes high accuracy leveling to detect any elevation changes affecting the relationship between the water level sensor and the local suite of tidal benchmarks..

This past December, scientists from CO-OPS and NGS discussed how to publish or otherwise make best use of historic, current, and future leveling data at tide stations across the United States. CO-OPS typically specifies Federal Geodetic Control Subcommittee (FGCS) second order, class two leveling procedures to maintain National Water Level Observation Network (NWLON) tide stations, but at times some specifications cannot be followed due to location, equipment, and personnel constraints. Nevertheless, the time series of annual leveling observations represents a unique and important dataset documenting local control network and tide gauge stability at hundreds of sites around the Nation's coasts..

If published, these leveling data would provide important information in estimating regional vertical land motion and possibly allowing future connections to existing geodetic

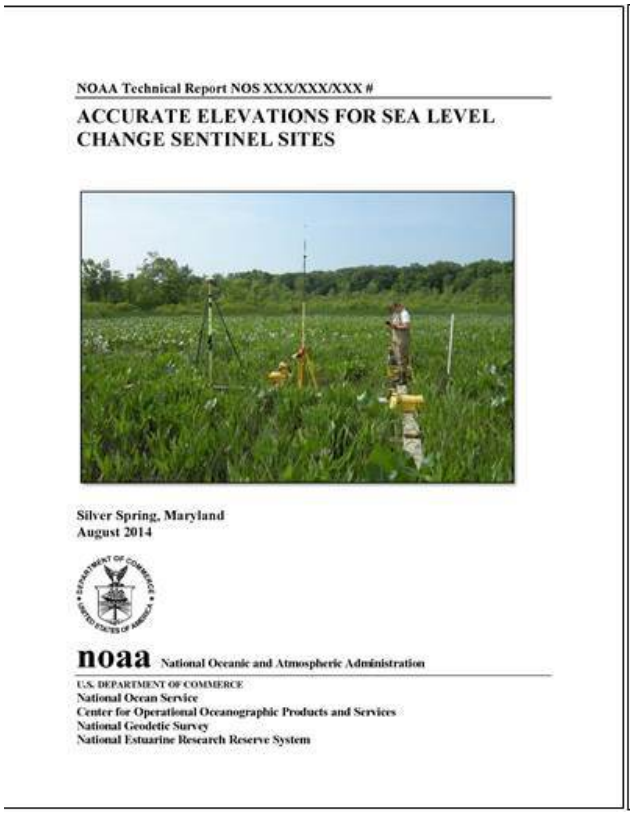
leveling networks. These connections, in turn, would help establish elevations in coastal communities relative to local tidal datums, which is a foundational component of NOAA's "Coastal Intelligences" and "Coastal Resilience" efforts. NGS has agreed to work with CO-OPS to test the feasibility to adjust and publish CO-OPS leveling data, starting off with a few pilot locations.

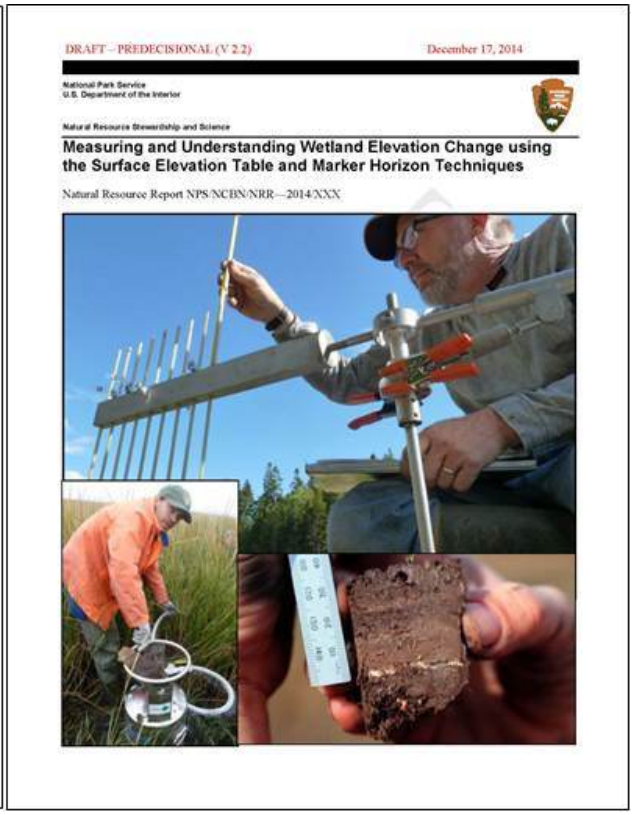
*Digital barcode leveling near a CO-OPS tide station.*

## 3. Update on Geospatial Infrastructure and Surface Elevation Table (SET) guidelines

The end of the 2014 calendar year witnessed a flurry of activity around two important documents that are co-authored by NGS ECO: geospatial guidelines for sentinel sites ("Accurate Elevations for Sea Level Change Sentinel Sites") and the National Park Service's standard operating procedures for the Surface Elevation Table ("Measuring and Understanding Wetland Elevation Change using the Surface Elevation Table and Marker Horizon Techniques").

The former document, previously approved by the NGS Products & Services Committee, is almost ready to publish thanks to our colleague from CO-OPS, Brenda Via, who kindly formatted the nearly 200-page document. This should be finalized within the next month. As for the SET protocols, a first draft of the document has been sent to authoring institutions (National Park Service, U.S. Geological Survey and NGS) for internal review. We hope to have a completed document by mid-year.



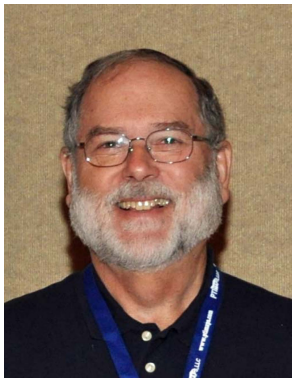

*Cover images from upcoming publications.*

## 4. In case you missed it!

- Earl Meredith, on rotational assignment to lead the Chesapeake Bay Sentinel Site Cooperative (CBSSC) since June 2014, has returned to his former position as Coordinator for Cooperative Research in Gloucester, MA. Among his notable accomplishments, Earl has successfully initiated an active "human built sentinel site" working group within the CBSSC. Andrew Larkin from NOAA's Chesapeake Bay Office will lead the CBSSC until a new Maryland Sea Grant extension agent comes aboard as the official coordinator later this spring. Thank you very much, Earl, for your dedication and enthusiasm!

- Galen Scott, the founder of the NGS ECO Team and currently a graduate student in the University of Rhode Island's , Department of Natural Resources Science, successfully defended his PhD research proposal to his committee this past November. His research will focus on comparisons among different surveying techniques and technologies for obtaining high precision, high accuracy elevations of wetland surfaces. He will be conducting his research in collaboration with the National Park Service at the Assateague Island National Seashore, in Maryland.

- Dave Newcomer, the geodetic advisor to Florida, retired from NGS in December. Dave has worked extensively with partners within the National Estuarine Research Reserves (NERRs) in Florida, Alabama, and Mississippi to develop local high accuracy geospatial control networks. Congratulations, Dave, on a great career, and thank you for your contributions to NGS-ECO!



## 5. Coming Up…

- The Chesapeake Bay Sentinel Site Cooperative is planning to have a face-to-face meeting, probably in Virginia, in April or May 2015. The aim is to have the meeting coincide with the installation of the new Sea Grant extension agent as coordinator of the Cooperative.

Please share this Newsletter with friends and colleagues interested in Geodesy at the Water's Edge. If you've received this from a friend click here to subscribe.